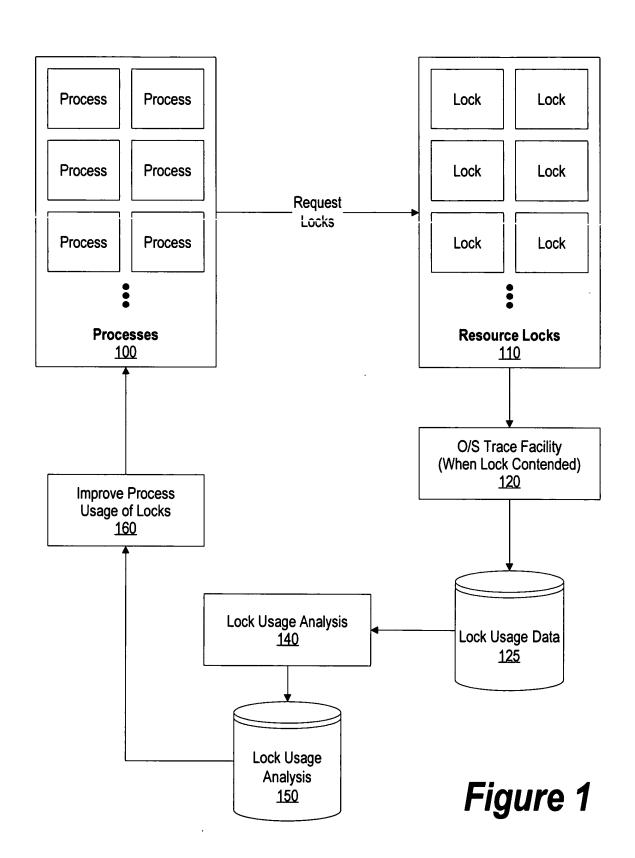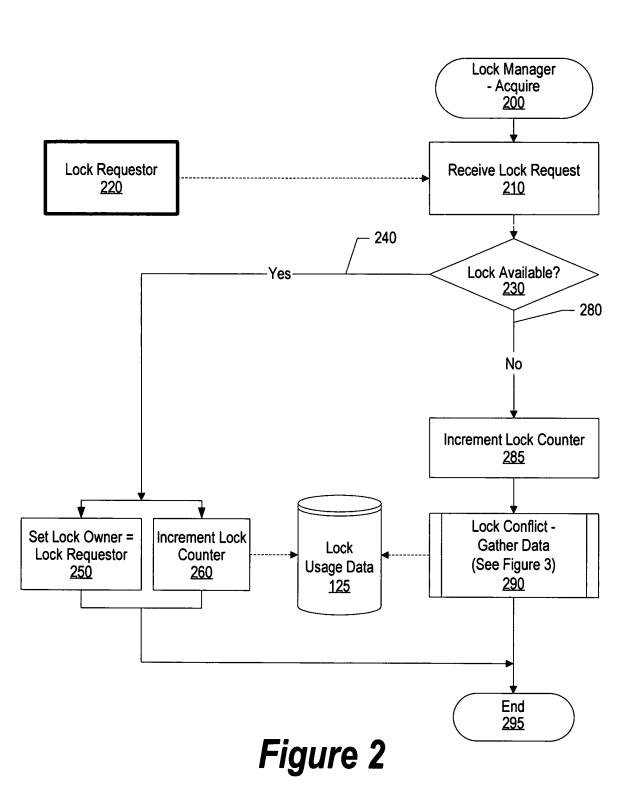EL978318493US

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Processes
100

Process	Process
Process	Process
Process	Process

Request Locks

Resource Locks
110

Lock	Lock
Lock	Lock
Lock	Lock

O/S Trace Facility
(When Lock Contended)
120

Lock Usage Data
125

Lock Usage Analysis
140

Lock Usage Analysis
150

Improve Process Usage of Locks
160

Figure 1

Lock Manager
- Acquire
200

Lock Requestor
220

Receive Lock Request
210

— 240

Yes

Lock Available?
230

— 280

No

Increment Lock Counter
285

Set Lock Owner =
Lock Requestor
250

Increment Lock
Counter
260

Lock
Usage Data
125

Lock Conflict -
Gather Data
(See Figure 3)
290

End
295

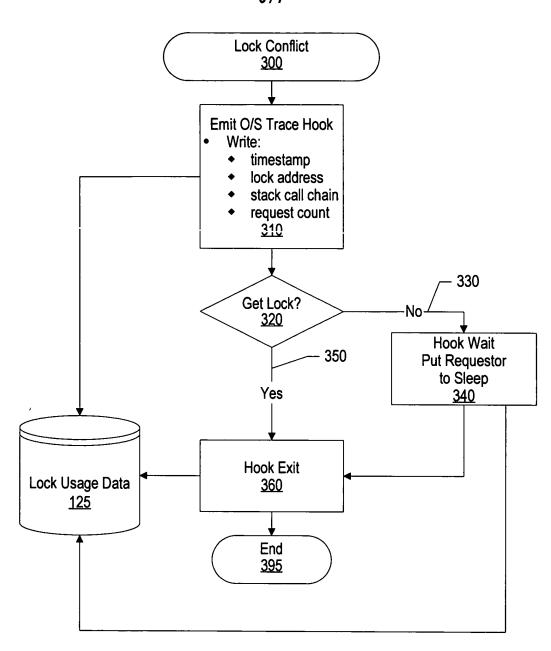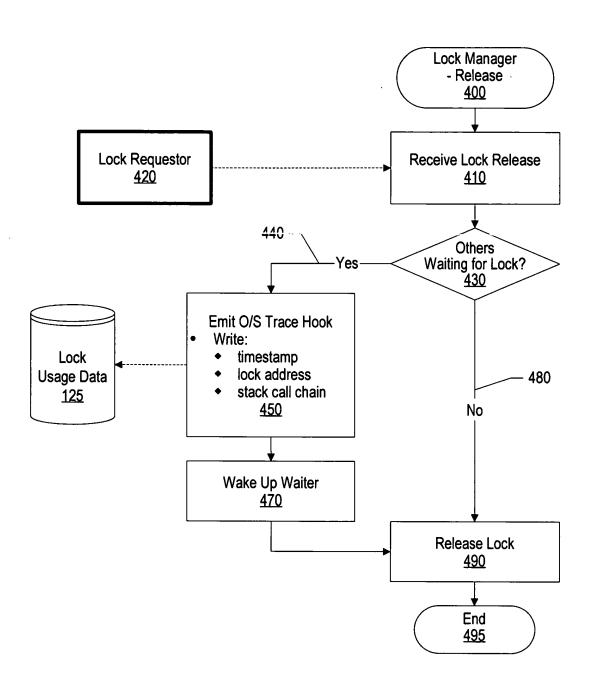*Figure 2*

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```
                    ┌─────────────────────┐
                    │    Lock Conflict     │
                    │        300           │
                    └─────────────────────┘
                               │
                               ▼
                    ┌─────────────────────┐
                    │  Emit O/S Trace Hook │
                    │  •  Write:           │
                    │     ◆ timestamp      │
                    │     ◆ lock address   │
                    │     ◆ stack call chain│
                    │     ◆ request count  │
                    │         310          │
                    └─────────────────────┘
                               │
                               ▼
                          ◇ Get Lock? ◇──── No ───┐── 330
                          ◇    320   ◇            │
                               │                  ▼
                           ┌── 350         ┌──────────────┐
                           │               │  Hook Wait   │
                          Yes              │ Put Requestor│
                           │               │  to Sleep    │
                           ▼               │     340      │
                    ┌──────────────┐       └──────────────┘
   ┌──────────┐     │  Hook Exit   │              │
   │Lock Usage│◄────│     360      │◄─────────────┘
   │   Data   │     └──────────────┘
   │   125    │              │
   └──────────┘              ▼
                      ┌──────────────┐
                      │     End      │
                      │     395      │
                      └──────────────┘
```

Figure 3

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Lock Manager
- Release
400

Lock Requestor
420

Receive Lock Release
410

440

Yes

Others
Waiting for Lock?
430

Emit O/S Trace Hook
• Write:
    ◆ timestamp
    ◆ lock address
    ◆ stack call chain
450

Lock
Usage Data
125

480

No

Wake Up Waiter
470

Release Lock
490

End
495

Figure 4

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Lock Usage Data 125

— 510

Hook 1 (Request)
- Lock Identifier "A"
- Process Identifier "X"
- Stack Call Data
- Timestamp

— 540

520

Wait Time for Process "X" to Acquire Lock "A"

Hook *m* (Acquire)
- Lock Identifier "A"
- Process Identifier "X"
- Timestamp

— 550

Amount of Time Process "X" Holds Lock "A"

Hook *n* (Release)
- Lock Identifier "A"
- Process Identifier "X"
- Timestamp

— 530

Figure 5

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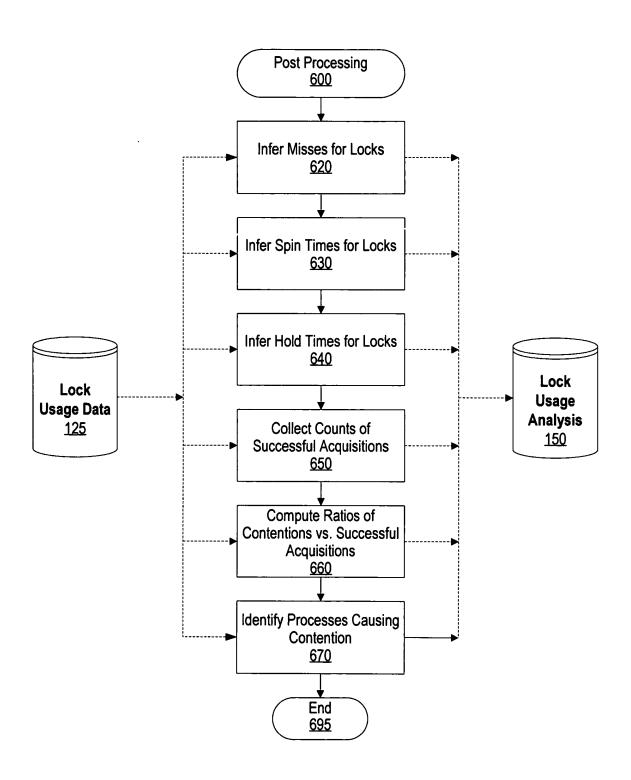System and Method for Measuring Latch Contention in a Database

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Figure 6

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722

JTAG/I2C Busses

Processor(s)
700

701

702

Host Bus

Level Two Cache
704

JTAG/I2C Busses

JTAG/I2C Busses

Main Memory
708

Host-to-PCI
Bridge 706

JTAG/I2C Busses

710

PCI Bus

Service Processor
Interface & ISA Access
Passthru
712

LAN Card
730

714

PCI Bus

USB 745

Service
Processor
716

Flash
Memory
718

PCI-to-ISA
Bridge

735

755

790
ring

Modem 775

NVRAM
720

764

Serial

Parallel 762

ISA Bus

740

Mouse

Keyboard

770

768

Figure 7